



Opinion of Probable Construction Cost

BROWN AND
CALDWELL

MEMORANDUM

April 26, 2005

TO: Ed Basham

FROM: Don Snowden

SUBJECT: Sta 2 – Cell 4 Expansion
Basis of Design Report
BASIS OF ESTIMATE OF PROBABLE CONSTRUCTION COST

This memorandum presents the Basis of the Estimate of Probable Construction Cost (estimate) prepared for the Sta 2 – Cell 4 Expansion project in Palm Beach County. The memorandum contains the following information:

- Background of this Estimate
- Class of Estimate
- Estimating Methodology
- Direct Cost Development
- Indirect Cost Development
- Bidding Assumptions
- Estimating Assumptions
- Estimating Exclusions
- Contractor and Other Estimate Markups
- Allowances for Known but Undefined Work

Background of this Estimate

The attached cost opinion is based on a spreadsheet outlining the elements of work with calculated quantities received from Ed Basham on March 15, 2005, which was represented as the basis of design completion. Additionally, the markups were based on the client supplied “Cost Procedures Document”.

Class of Estimate

This is a Class 3 estimate. A Class 3 estimate is defined as a Project Budget Estimate or Funding Request Estimate. Typically, engineering is from 20 percent to 60 percent complete. Class 3 estimates are used to prepare budget funding request or to evaluate design options and form the base work for the Class 2 Design Baseline or Control Estimate.

Expected accuracy for Class 3 estimates typically range from -20 percent on the low side, and from +30 percent on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. In unusual circumstances, ranges could exceed those shown.

Estimating Methodology

This estimate was prepared using quantity takeoffs furnished by the design team. The estimate includes direct labor costs, anticipated productivity adjustments to the labor, and operating and use cost of the construction equipment as they apply to the project conditions.

Construction labor crew and equipment hours were calculated from production rates contained in documents and electronic databases published by R.S. Means, Mechanical Contractors Association (MCA), National Electrical Contractors Association (NECA), Rental Rate Blue Book for Construction Equipment (Blue Book), and Richardson Engineering Services.

This estimate was prepared using BC's estimating system, which consists of a Windows-based commercial estimating software engine using BC's material and labor database, modified to include historical project data and the latest vendor and material cost information, and other costs specific to the locale of the project.

Direct Cost Development

The costs associated with the General Provisions and the Special Provisions of the construction documents are collectively referred to as Contractor General Conditions (CGC). The estimates for CGCs are divided into two groups: a time-related group (e.g., field personnel), and non-time-related group (e.g., bonds and insurance). Non-labor field overhead, such as office trailers, and utilities have been included as line items in the estimate. Labor related field overhead, (Project Management & Supervision) has been included as a below the line markup per the Client's "Cost Procedures Document". Employees' portion of labor burdens such as health and welfare, vacation, union benefits, payroll taxes, and workers compensation insurance are included in the labor rates used. A separate mark up for Employer's portion of labor burdens has been included per the Client's "Cost Procedures Document". No trade discounts were considered.

Indirect Cost Development

Local sales tax has been applied to materials only per the Client's "Cost Procedures Document". No separate percentage allowance for contractor's home office expense has been included in the overall rate mark-ups per the Client's "Cost Procedures Document".

The Client's "Cost Procedures Document" include the contractor's cost for builder's risk, liability, and vehicle insurance, along with the Bond cost as a single item. . Based on historical data, this is typically 2 percent of the overall construction contract amount. These indirect costs have been included in this estimate as a percentage of the gross cost and are added to the net totals after the net markups have been applied to the appropriate items.

Bidding Assumptions

The following are bidding assumptions considered in the development of the estimate.

1. Bidders must hold a valid, current Contractor's license in the state in which the project is being constructed and applicable to the type of project being constructed.
2. Bidders will develop estimates with a competitive approach to material pricing and labor productivity, and will not include allowances for changes, extra work, unforeseen conditions, or any other unplanned costs.
3. Estimated costs are based on a minimum of four bidders. Actual bid prices may increase for fewer bidders or decrease for a higher number of bidders.
4. Bidders will account for General Provisions and Special Provisions of the contract documents and will perform all work except electrical.

Estimating Assumptions

The following are the assumptions for the contractor's activities considered in the development of the estimate.

1. Contractor performs the work during normal daylight hours, nominally 7 a.m. to 5 p.m., Monday through Friday, in an 8-hour shift. No allowance has been made for overtime, additional shift work or weekend work.
2. Contractor has complete access for lay-down areas and mobile equipment.
3. Equipment rental rates are based on verifiable pricing from the local project area rental yards, Blue Book rates, and rates contained in the estimating database.
4. Contractor markup is based on conventionally accepted values and then adjusted for project-area economic factors.
5. Bulk material quantities are based on manual quantity takeoffs that have been entered into the estimating program.
6. Assumed that there is enough overburden and friable material from the excavations to seal rock embankments.
7. Assumed that blasting fractures the rock sufficiently that it can be readily excavated with a track backhoe.
8. Assumed that blasting does not fracture the rock to the extent it is practical to utilize scrapers for this work.

9. Assumed recently experienced local drill and blast cost. This can vary greatly with field conditions, and may be substantially altered with more detailed geotechnical information.
10. Assumed 50 hour workweek for earthwork per local custom at Project Manager's direction. Earthwork wage rates were adjusted to 1½ time regular rates for 2 hours per day. Earthwork manhours were increased by 29% to account for the overall productivity reduction due to sustained overtime. Equipment rates were reduced by 25% to account for the operating cost only (no rental charge) during the 2 hrs of overtime each day.

Estimating Exclusions

The following are the estimating exclusions assumed in the development of the estimate.

1. No hazardous materials remediation and/or disposal is required.
2. Removal of soil contaminated by hazardous material.
3. Any permits beyond those normally needed for the type of project and project conditions are excluded unless otherwise noted.

Contractor and Other Estimate Markups

Contractor markups were Owner supplied as follows:

Item	Rate, percent
Labor Burden	
Small Tools & Supplies	5
GC's Labor (<i>Field Project Management & Supervision</i>)	34
Trade Labor (<i>Employer Payroll Burden</i>)	28
City Adjustment – Use Union Labor	
Direct Cost	
Materials Sales Tax (<i>applied to materials only</i>)	6
Equipment Fuel and Maintenance (<i>applied to equipment only</i>)	6
Material Escalation from Quote (<i>applied to materials only</i>)	9
Contingency (<i>applied to all categories after direct markups</i>)	30
Project Reserve (<i>applied to all categories after direct markups</i>)	5
Overhead & Profit (<i>applied to all categories after direct markups</i>)	10
Bonds * Insurance (<i>applied to all categories after direct markups</i>)	3.5

Attachments

cc: James L. Matthews

**South Florida Water Management District
Basis of Design Report Estimate
ENR CCI 7297**

Project Number:: 126242-400-025

Client:: South Florida Water Management District:
Estimator(s):: Don Snowden
Estimating Office:: West Monroe
Estimate Issue Number:: 01
Estimate Original Issue Date:: March 17, 2005
Estimate Revision Number:: 03
Estimate Revision Date:: April 25, 2005
BC Project Manager:: Ed Basham
Estimate QA/QC Reviewer:: Butch Matthews
Estimate QA/QC Date:: March 17, 2005

PROJECT LOCATION / PROCESS AREA

Basis of Design Report Estimate

South Florida Water Management District
STA 2 - Cell 4 Expansion
ENR CCI 7297

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Minor Section	Item	Item Description	Quantity	Unit	Labor Factor	Equipment Factor	Material Factor	Labor \$/Unit	Labor Amount	Materials \$/Unit	Material Amount	Equip Amount	Subs Amount	Other Amount	Labor Factor	Equipment Factor	Material Factor	Total Unit Price	Grand Total
1 - NE Inflow Canal																			
02390	0010	Backhoe excavating & loading blasted mat'l. = 100 CY/hr	95,400	cuyd			736.00	0.78	74,343			73,229					736.00	1.55	147,572
2 - NE Inflow Levee																			
02360	0020	Compaction, sheepsfot or wobbly wheel roller, 24" lifts, select fill	79,500	cuyd			736.00	0.07	5,479			5,324					736.00	0.14	10,802
02320	0030	Backfill, F.E. Loader backfilling, bulk, up to 150' haul, no compaction	95,400	cuyd			0.74	0.72	68,350			65,121					0.74	1.40	133,471
3 - North Perimeter Canal																			
02390	0010	Backhoe excavating & loading blasted mat'l. = 100 CY/hr	232,080	cuyd			736.00	0.82	189,961			171,194					736.00	1.56	361,155
4 - North Perimeter Levee																			
02360	0020	Compaction, sheepsfot or wobbly wheel roller, 24" lifts, select fill	193,400	cuyd			736.00	0.05	10,182			15,179					736.00	0.13	25,361
02320	0030	Backfill, F.E. Loader backfilling, bulk, up to 150' haul, no compaction	232,080	cuyd			0.74	0.88	205,058			110,716					0.74	1.36	315,775
5 - South Discharge Canal																			
02390	0010	Backhoe excavating & loading blasted mat'l. = 100 CY/hr	179,760	cuyd			736.00	0.82	147,136			132,600					736.00	1.56	279,737
6 - South Discharge Levee																			
02360	0020	Compaction, sheepsfot or wobbly wheel roller, 24" lifts, select fill	149,800	cuyd			736.00	0.05	7,886			11,757					736.00	0.13	19,643
02320	0030	Backfill, F.E. Loader backfilling, bulk, up to 150' haul, no compaction	179,600	cuyd			0.74	0.88	158,689			85,680					0.74	1.36	244,369
7 - South Collection Canal																			
02390	0010	Backhoe excavating & loading blasted mat'l. = 100 CY/hr	89,880	cuyd			736.00	0.82	73,568			66,300					736.00	1.56	139,868
8 - South Perimeter Levee																			
02360	0020	Compaction, sheepsfot or wobbly wheel roller, 24" lifts, select fill	74,900	cuyd			736.00	0.05	3,943			5,879					736.00	0.13	9,822
02320	0030	Backfill, F.E. Loader backfilling, bulk, up to 150' haul, no compaction	89,880	cuyd			0.74	0.88	79,415			42,878					0.74	1.36	122,293
10 - East Levee																			
02460	0010	Hauling, LCY, no loading, 16 CY dump truck, 4 mile RT, 1.6 lds/hr	145,900	cuyd				0.90	131,858			283,162						2.84	415,020
02360	0020	Compaction, sheepsfot or wobbly wheel roller, 24" lifts, select fill	145,900	cuyd			736.00	0.05	7,681			11,451					736.00	0.13	19,132
02320	0030	Backfill, F.E. Loader backfilling, bulk, up to 50' haul, no compaction	175,080	cuyd			0.74	0.22	38,905			51,331					0.74	0.52	90,235
02460	0900	Loading Trucks, F.E. Loader, 3 C.Y.	145,900	cuyd				0.25	37,105			120,613						1.08	157,718
11 NNRL Grading Modifications																			
02430	0010	Fill, spread dumped material, by dozer, no compaction	8,400	cuyd			0.74	0.38	3,167			5,496					0.74	1.03	8,663
02360	0020	Compaction, sheepsfot or wobbly wheel roller, 24" lifts, select fill	7,000	cuyd			736.00	0.05	364			543					736.00	0.13	906

Basis of Design Report Estimate

South Florida Water Management District
STA 2 - Cell 4 Expansion
ENR CCI 7297

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Minor Section	Item	Item Description	Quantity	Unit	Labor Factor	Equipment Factor	Material Factor	Labor \$/Unit	Labor Amount	Materials \$/Unit	Material Amount	Equip Amount	Subs Amount	Other Amount	Labor Factor	Equipment Factor	Material Factor	Total Unit Price	Grand Total
12 Blasting																			
02370	0050	Drilling & blasting, bulk drilling & blasting, can vary greatly, avg	602,190	cuyd			0.74							1,204,380			0.74	2.00	1,204,380
13 Degraded Farm Roads																			
02390	0050	Excavating & Loading Road Section to native, FE loader, whl mtd, 1.5	125,400	cuyd			0.74	1.35	169,116			113,555					0.74	2.25	282,671
14 Clear & Grub																			
02210	0010	Clear & grub, brush, including stumps	170	acre			0.74	284.98	48,447			156,156					0.74	1,203.55	204,603
15 Inflow Structures																			
02450	0010	Excavate trench, cont ftg, no sht or dewtrg, 4'-6' D, 1-1/2 CY hyd bac	1,719	cuyd			0.74	0.71	1,224			1,635					0.74	1.66	2,859
02340	0010	Bedding, crushed stone 3/4" to 1/2"	1,200	cuyd			0.74	3.37	4,050	11.86	14,229	1,516					0.74	16.50	19,794
02460	0020	Hauling, LCY, no loading, 12 c.y dump truck, 10 MI RT, 0.60 lds/hr	2,148	cuyd			0.74	2.71	5,814			18,716					0.74	11.42	24,530
02360	0030	Compaction, vibratory plate, 8" lifts, Subgrade	123	cuyd			0.74	0.91	112			30					0.74	1.15	141
02360	0040	Compaction, vibratory plate, 8" lifts, Bedding	1,032	cuyd			0.74	0.91	939			248					0.74	1.15	1,187
15025	0100	Piping, water dist, PCCP, 150 PSI, 24' L, 66" dia	780	lnft			0.74	25.42	19,829	191.76	149,570	52,717					0.74	284.76	222,116
11040	0110	Hydraulic structures, slide gate, self contained, ab & grout, 72" x 72"	6	each			0.74	1,916.31	11,498	24,194.72	145,168	10,502					0.74	27,861.43	167,169
15090	0220	Piping, water dist, conc pipe, gasket, 66" dia	33	each			0.74			14.89	491						0.74	14.89	491
02460	0900	Loading Trucks, F.E. Loader, 3 C.Y.	2,148	cuyd			0.74	0.28	597			1,777					0.74	1.11	2,374
16 Outflow Structures																			
02560	0990	Drainage, 8' x 8' precast box culvert, 8' section	400	lf			0.74	7.77	3,107	262.95	105,178	3,197					0.74	278.71	111,483
17 Weir SS Hardware																			
05010	0060	Weir plate, 316 ss, with machined slots and anchor bolts	220	sqft			0.74	2.40	529	29.97	6,593						0.74	32.37	7,122
05300	0070	Bolts & hex nuts, ss, 316, 3/8" diameter, 2" long	220	each				2.63	579	0.60	131							3.23	711
05010	0998	Nelson Studs, steel, 3/4" w/ 3"8" fillet	55	each			0.74	0.33	18	2.86	158						0.74	3.20	176
18 Flowable Fill																			
03170	0080	Placing conc, incl vib, footings, continuous, pumped	30	cuyd			0.74	8.76	263			137					0.74	13.33	400
03150	0140	Concrete, ready mix, flow fill, struct, ash/cem/agg/water/sand, 1000 p	30	cuyd			0.74			61.76	1,853						0.74	61.76	1,853
19 C.I.P. Reinforced Concrete																			
03110	0999	Concrete Structure (Conceptual)	564	cuyd			0.74							439,920			0.74	780.00	439,920
20 Power Distribution																			
		Power Distribution	2	mile										160,000				80,000.00	160,000

Basis of Design Report Estimate

South Florida Water Management District
STA 2 - Cell 4 Expansion
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21 Telemetry																			
		Telemetry	6	ea										54,000				9,000.00	54,000
22 Stilling Wells																			
		Stilling Wells	7	pr										150,500				21,500.00	150,500
23 Control Structures Electrical																			
		Electrical Control Structures	6	ea										204,000				34,000.00	204,000
24 Temporary Muck Berms																			
02220	0070	Stripping, strip topsoil, clay, dry & soft, 200 HP dozer, adverse cond	20,000	cuyd			0.74	0.34	6,769			19,235					0.74	1.30	26,004
25 Fill N/S Ditches																			
02320	0030	Backfill, dozer backfilling, bulk, up to 150' haul, no compaction	120,000	cuyd			736.00	0.36	43,156			76,764					736.00	1.00	119,920
26 Filling NNRL Ditch																			
02320	0030	Backfill, dozer backfilling, bulk, up to 150' haul, no compaction	72,000	cuyd			736.00	0.36	25,894			46,058					736.00	1.00	71,952
27 Degrade PSTA Cells																			
02390	0050	Excavate & Spread Loose, 300' haul, FE loader, whl mtd, 1.5 CY cap =	14,097	cuyd			0.74	1.37	19,296			12,957					0.74	2.29	32,253
28 Remove Pipe from PSTA Cells																			
02450	0010	Excavate trench, cont ftg, no sht or dewtrg, 4'-6' D, 1-1/2 CY hyd bac	355	cuyd			0.74	0.71	253			338					0.74	1.66	590
02320	0040	Backfill, dozer backfilling, trench, up to 150' haul, no compaction	320	cuyd			0.74	0.39	123			199					0.74	1.01	322
02060	0420	Site dml, pipe removal, sewer/water, no excavation, 24" dia	400	lnft			0.74	4.22	1,688			632					0.74	5.80	2,319
02460	0900	Loading Trucks, F.E. Loader, 3 C.Y.	67	cuyd			0.74	0.28	19			55					0.74	1.11	74
29 Remove Structures from PSTA Cells																			
02060	0190	Site dml, conc to 6" thick, rod reinforced	160	sqyd			0.74	4.28	684			784					0.74	9.18	1,468
30 Demo Farm Shop Building																			
		Demo Farm Shop Building	1	ea										25,000				25,000.00	25,000
31 Demo S.O.G. at Rock Pit																			
02060	0550	Site dml, slab on grade removal, rod reinforced	69	cuyd			0.74	46.78	3,228			2,734					0.74	86.40	5,961
32 Demo Farm Pump Houses and Piping																			
		Demo Farm Shop Building	3	ea										75,000				25,000.00	75,000

Basis of Design Report Estimate

South Florida Water Management District
STA 2 - Cell 4 Expansion
ENR CCI 7297

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33 Remove & Dsipose of Junk & Trash																			
02460	0030	Hauling, LCY, no loading, 12 c.y dump truck, 20 MI RT, 0.4 lds/hr	62	cuyd			0.74	4.03	250			803					0.74	16.98	1,053
02160	9999	Dump Charge, typical urban city, fees only, bldg constr mat'ls	75	ton										4,125				55.00	4,125
34 Remove Drain Pipe & Stop Logs																			
02060	0030	Site dml, no hauling, remove existing stop log framing	65	each			0.74	126.56	8,226			3,079					0.74	173.93	11,305
02060	0410	Site dml, pipe removal, sewer/water, no excavation, 12"-18" dia	1,950	lnft			0.74	3.37	6,581			2,463					0.74	4.64	9,044
35 Remove 66" CMP Culverts from New River Levee @ Farm P.S. & Restore Levee																			
02450	0010	Excavate trench, cont ftg, no sht or dewtrg, 4'-6' D, 1-1/2 CY hyd bac	537	cuyd			0.74	0.71	382			511					0.74	1.66	893
02430	0010	Fill, spread dumped material, by dozer, no compaction	334	cuyd			0.74	0.38	126			219					0.74	1.03	344
02360	0030	Compaction, vibratory plate, 24" lifts, Subgrade	29	cuyd			0.74	0.25	7			2					0.74	0.31	9
02360	0030	Compaction, vibratory plate, 24" lifts, Backfill	303	cuyd			0.74	0.25	75			18					0.74	0.31	93
02320	0040	Backfill, dozer backfilling, trench, up to 150' haul, no compaction	337	cuyd			0.74	0.39	130			209					0.74	1.01	339
02060	0450	Site dml, pipe removal, sewer/water, no excavation, 48" - 66" dia	180	lnft			0.74	205.66	37,018			13,856					0.74	282.63	50,874
36 Demo & Degrade Field Loading Ramp																			
02390	0010	Backhoe excavating & loading, = 100 CY/hr	288	cuyd			736.00	0.82	236			212					736.00	1.56	448
02060	0200	Site dml, conc7" to 24" thick, rod reinforced	20	cuyd			0.74	35.64	713			816					0.74	76.46	1,529
37 Place 4" Muck Top Soil																			
02430	0030	Fill, sprd F, from stkpile W/ 2-1/2 c.y f.e lder, 130 h.p 300' haul	31,000	cuyd			0.74	0.55	16,972			30,853					0.74	1.54	47,825
38 Seed Slopes (includes top 5' on water side)																			
02840	0310	Seeding mechanical seeding, 215 lb./acre	57	acre			0.74	128.17	7,306	425.19	24,236	6,714					0.74	671.16	38,256
39 18" Rip Rap																			
02480	0010	Rip-rap, random, machine placed for slope protection	1,000	cuyd			0.74	6.20	6,202	20.48	20,483	13,700					0.74	40.39	40,386
41 Filter Fabric																			
02470	0020	Soil stabilization, geotextile fabric, woven, H.D., 600 lb. tensile st	2,000	sqyd			0.74	0.13	261	1.69	3,379						0.74	1.82	3,641
42 Road Base																			
02460	0010	Hauling, LCY, no loading, 12 CY dump truck, 1 mile RT 2.7 lds/hr	19,500	cuyd			736.00	0.55	10,787			23,421					736.00	1.75	34,208
02360	0020	Compaction, sheepsfoot or wobbly wheel roller, 8" lifts, select fill	19,500	cuyd			736.00	0.16	3,068			4,575					736.00	0.39	7,643
02320	0030	Backfill, dozer backfilling, bulk, up to 150' haul, no compaction	19,500	cuyd			736.00	0.36	7,013			12,474					736.00	1.00	19,487
02390	0050	Excavate & Spread Loose, 300' haul, FE loader, whl mtd, 1.5 CY cap =	19,500	cuyd			0.74	1.37	26,692			17,923					0.74	2.29	44,615
		Crusher, incl mob, de-mob & operation	1	each										40,000				40,000.00	40,000

Basis of Design Report Estimate

South Florida Water Management District
STA 2 - Cell 4 Expansion
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43 Dewatering																			
02240	0150	Dewatering, pumping 8 hr, unattended, 8" centrifugal pump	330	each								78,702						238.49	78,702
02240	0160	Dewatering, pumping 8 hr, unattended, add per additional 8" pump	990	day									109,445					110.55	109,445
44 Temporary Facilities																			
		Temporary Facilities	14	mnth										35,000				2,500.00	35,000
45 Field Vehicles																			
		Field Vehicles	4	each										95,000				23,750.00	95,000
46 Modify G337A for Flow Control																			
11050	0290	Hydraulic structures, sluice gate, HD, self cont w/actuator, 78" x 78"	4	each				3,880.52	15,522	57,754.74	231,019	46,709						73,312.59	293,250
02070	1090	Equip. dml,30" vertical turbine pump, motor, complete	4	each				288.39	1,154	355.77	1,423		2,000					1,144.16	4,577
47 Mobilization																			
		Mobilization	1	each										405,851				405,851.00	405,851
48 Demobilization																			
		De-Mobilization	1	each										405,851				405,851.00	405,851
49 Survey for Stage Monitor Set-up																			
		Survey for Stage Monitor Set-up	1	lsum									35,000					35,000.00	35,000
50 Gate Position Sensors																			
		Gate Position Sensors	10	ea				8,000.00	80,000	12,000.00	120,000							20,000.00	200,000
Grand Total							0.83	1,839,041		823,912	2,035,653	146,445	3,298,627				0.83	8,143,678	

STA 2 - Cell 4 Expansion

South Florida Water Management District
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Category	Percent	Amount	Hours
Labor	22.58 %	1,839,041	65,619.3
Material	10.12 %	823,912	
Equipment	25.00 %	2,035,653	38,084.3
Subcontractor	1.80 %	146,445	
Other	40.51 %	3,298,627	
Net Costs		8,143,678	
Small Tools	5.00 %	91,952	
GCs Labor Burden	34.00 %	625,274	
Trade Labor Burden	28.00 %	514,932	
Sales tax (material)	6.00 %	49,435	
Equipment Fuel & Maintenance	6.00 %	122,139	
Material Escalation from Quote	9.00 %	74,152	
Net Markups Total		1,477,884	
Construction Contingency	30.00 %	2,886,468	
Project Reserve	5.00 %	481,078	
Overhead & Profit	10.00 %	962,156	
Bonds	3.50 %	336,755	
Total Estimate		14,288,019	